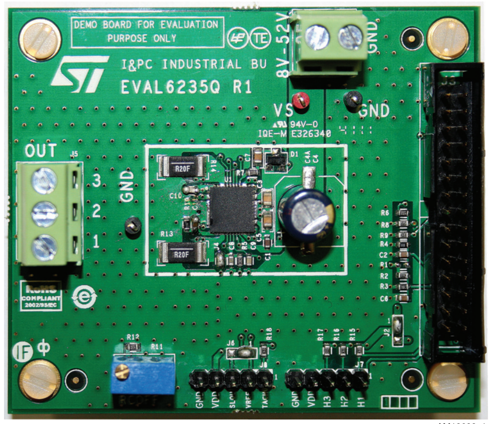
EVAL6235Q

3-phase BLDC motor driver mounting the L6235Q

Data brief

Features

- Voltage range from 8 V to 52 V
- Phase current up to 2.5 Ar.m.s.
- Adjustable PWM current control OFF-time
- Logic inputs 5 V / 3.3 V compliant
- Hall sensor inputs
- External speed loop
- Small application footprint with high thermal performance
- Suitable for use in combination with PractiSPIN™ 2 software



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Description

The EVAL6235Q is a 3-phase BLDC motor driver board that allows the user to test the L6235Q functions.

The board can be driven using the STEVAL-PCC009V2 communication board and the PractiSPIN 2 evaluation software.

1 Board description

Table 1. EVAL6208Q electrical specifications

Parameter	Value
Supply voltage (VS)	8 to 52 V
Maximum output current (each phase)	2.5 Ar.m.s.
Low level logic input voltage	0 V
High level logic input voltage	5 V / 3.3 V [1]
Maximum VREF input voltage (J2 connector)	3.3 V
Switching frequency	Up to 100 kHz
Operating temperature	- 25 to +125 °C
L6235Q thermal resistance junction-to-ambient	TBD

1. Logic inputs are 3.3 V and 5 V compliant.

Figure 1. Trimmer, jumper and connector locations

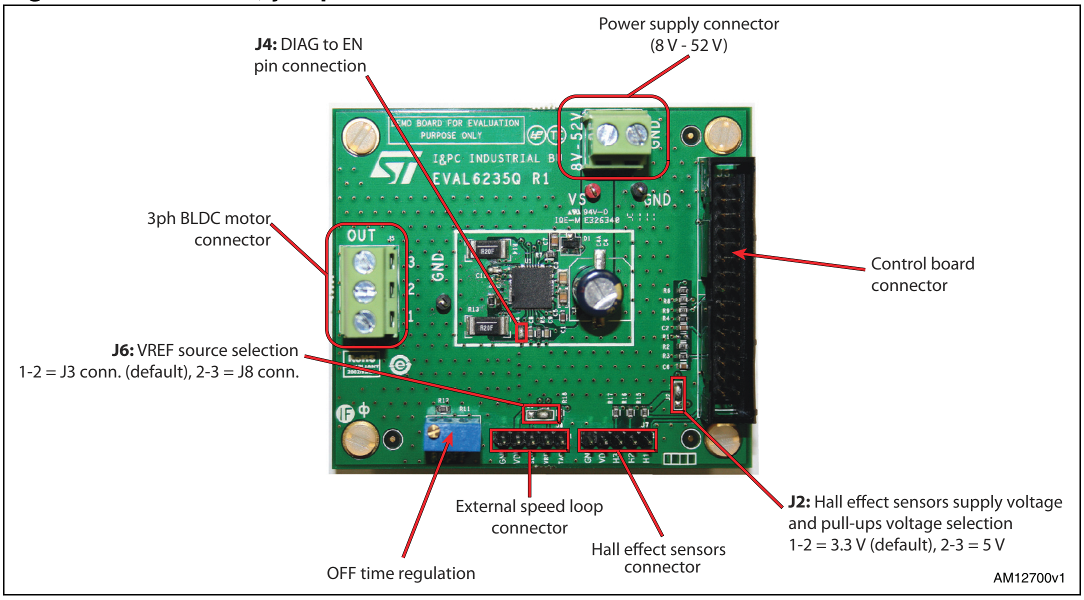


Table 2. Control board connector pinout (J3)

Pin	Type	Function
1	Power supply	5 V supply voltage
2	Ground	Ground
3	Logic output	Hall effect H1 signal (H1 input of L6235Q)
4	Logic input	Direction input (FW/REV input of L6235Q)
5	Logic output	Hall effect H3 signal (H3 input of L6235Q)
6	Logic input	Motor brake input (BRAKE input of L6235Q)
11	Analog input	Reference voltage for current control system
13	Ground	Ground
14	Supply voltage	3.3 V supply voltage
15	Logic output	Hall effect H2 signal (H2 input of L6235Q)
16	Logic input	Device enable input (EN input of L6235Q)
23	Ground	Ground
24	Analog output	Board identification system ID0
25	Analog output	Board identification system ID1
28	Ground	Ground
29	Logic output	Fault output (DIAG output of L6235Q)
30	Logic input	Hall effect H2 signal (H2 input of L6235Q)
Others	Unconnected	

Table 3. Hall effect sensors connector pinout (J7)

Pin	Type	Function
1	Logic input	Hall effect H1 signal (H1 input of L6235Q)
2	Logic input	Hall effect H2 signal (H2 input of L6235Q)
3	Logic input	Hall effect H3 signal (H3 input of L6235Q)
4	Power supply	Hall effect sensor supply voltage VDD (selected through J2 jumper)
5	Ground	Ground

Table 4. External speed loop connector pinout (J8)

Pin	Type	Function
1	Logic output	TACHO output from L6235Q
2	Analog output	Speed loop reference voltage from J3 connector
3	Analog input	Speed loop output to L6235Q VREF pin (1)
4	Power supply	Supply voltage VDD (selected through J2 jumper)
5	Ground	Ground

1. The J6 jumper must be properly set (closed 2-3).

Figure 2. EVAL6235Q - schematic

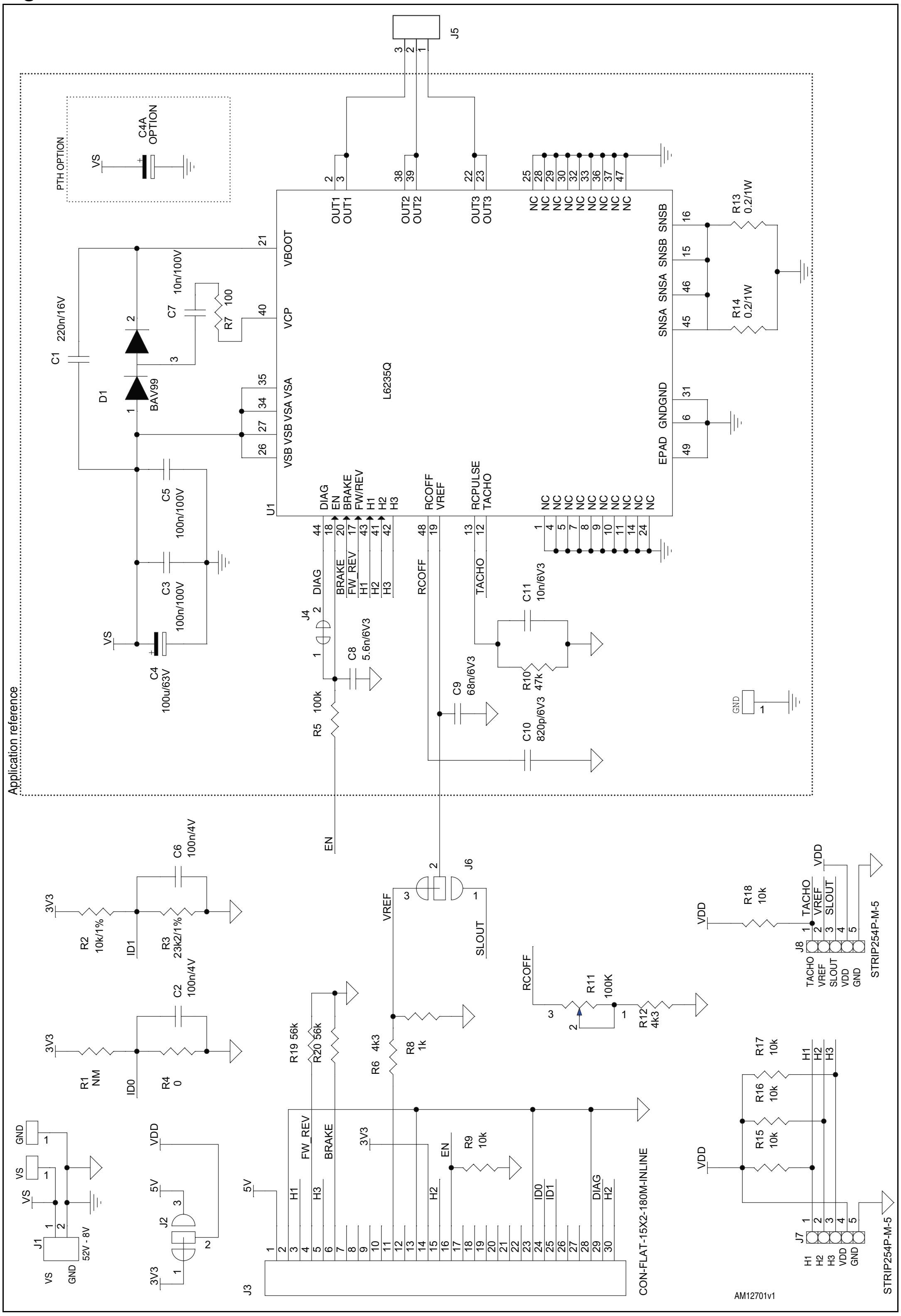


Table 5. EVAL6235Q - bill of material

Index	Quantity	Reference	Value	Package
1	1	C1	220 nF / 16 V	CAPC-0603
2	2	C2, C6	100 nF / 4 V	CAPC-0603
3	2	C3, C5	100 nF / 100 V	CAPC-0805
4	1	C4	100 µF / 63 V	CAPES-R10H10
5	1	C4A	100 µF / 63 V (option)	CAPE-R8H12-P35
6	1	C7	10 nF / 100 V	CAPC-0805
7	1	C8	5.6 nF / 6V3	CAPC-0603
8	1	C9	68 nF / 6V3	CAPC-0603
9	1	C10	820 pF / 6V3	CAPC-0603
10	1	C11	10 nF / 6V3	CAPC-0603
11	1	D1	BAV99	SOT23
12	1	J1	Screw connector 2 poles	MORSV-508-2P
13	2	J2, J6	Jumper - close 12	JP3SO
14	1	J3	Pol. IDC male header vertical 30 poles	CON-FLAT-15X2-180M
15	1	J4	Jumper - close	JP2SO
16	1	J5	Screw connector 3 poles	MORSV-508-3P
17	2	J7, J8	Pin strip header 1x5 poles	STRIP254P-M-5
18	1	R1	NM	RESC-0603
19	1	R2	10 kΩ / 1%	RESC-0603
20	1	R3	23.2 kΩ / 1%	RESC-0603
21	1	R4	0 Ω	RESC-0603
22	1	R5	100 kΩ	RESC-0603
23	2	R6, R12	4.3 kΩ	RESC-0603
24	1	R7	100 Ω	RESC-0603
25	1	R8	1 kΩ	RESC-0603
26	5	R9, R15, R16, R17, R18	10 kΩ	RESC-0603
27	1	R10	47 kΩ	RESC-0603
28	1	R11	100 kΩ	TRIMM-100x50x110-64W
29	2	R13, R14	0.4 Ω / 1 Ω	RESC-2512
30	2	R19, R20	56 kΩ	RESC-0603
31	1	TP1	TPTH-RING-1 mm red	TH
32	2	TP2, TP3	TPTH-RING-1 mm black	TH
33	1	U1	L6235Q	QFN7x7_48

Figure 3. EVAL6235Q - layout (silk screen)

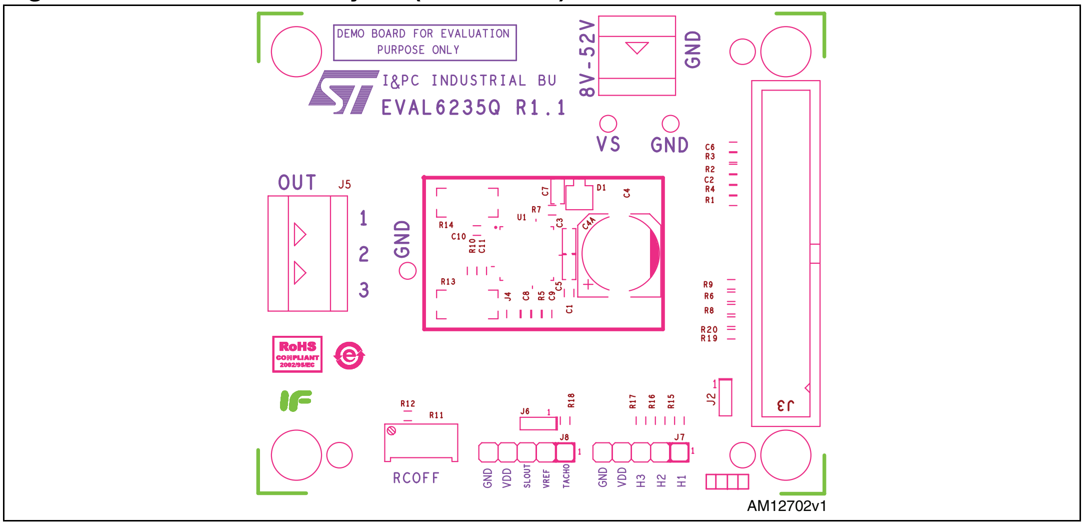


Figure 4. EVAL6235Q - layout (top layer)

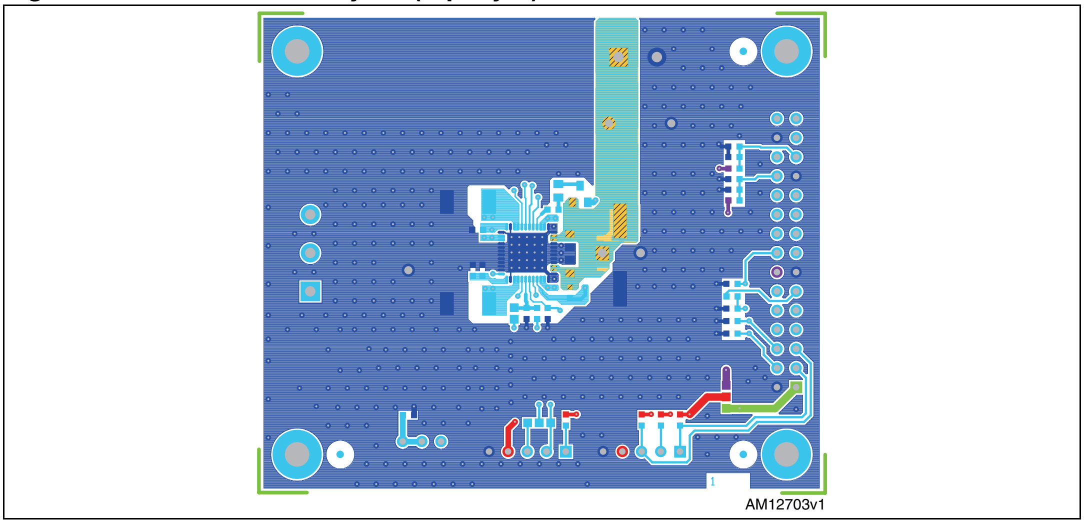


Figure 5. EVAL6235Q - layout (inner layer 2)

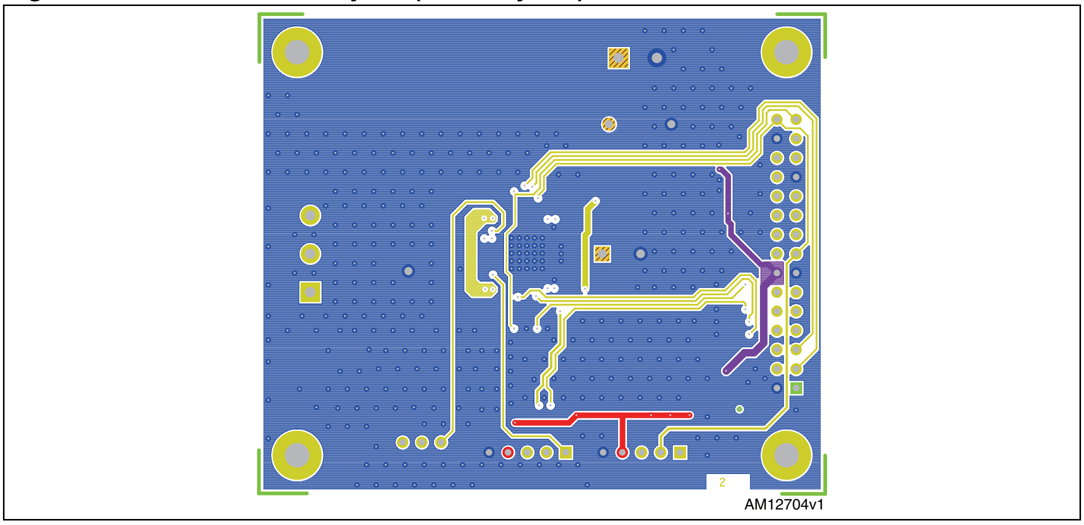
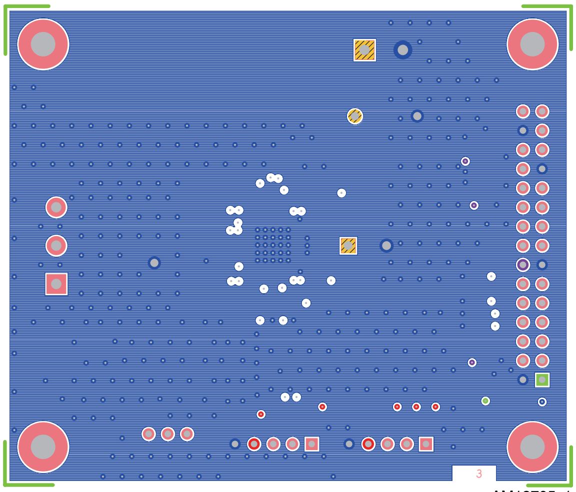
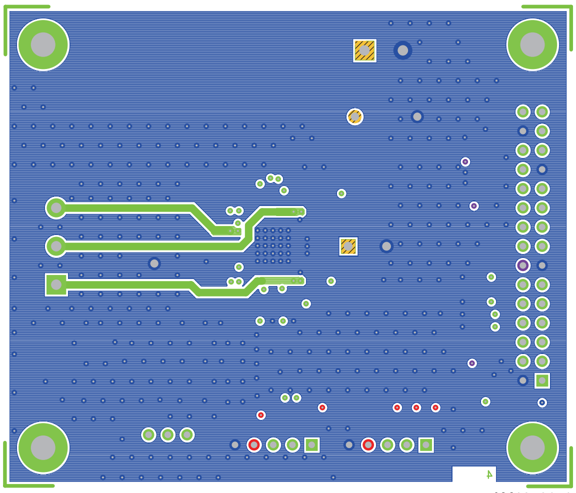


Figure 6. EVAL6235Q - layout (inner layer 3)



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Figure 7. EVAL6235Q - layout (bottom layer)



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2 Revision history

Table 6. Document revision history

Date	Revision	Changes
11-Apr-2012	1	Initial release.